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(54) Interaction between real-time and stored multimedia information

(57) A system providing for interaction between real-time and stored multimedia information system uses a processor in conjunction with a data buffer to compare user selected topic preferences with received real-time multimedia information such as television and radio signals. A query is formed by the processor on the basis of the comparison and is used to search the non real-time, electronically stored, multimedia information so that related information may be provided to the user.

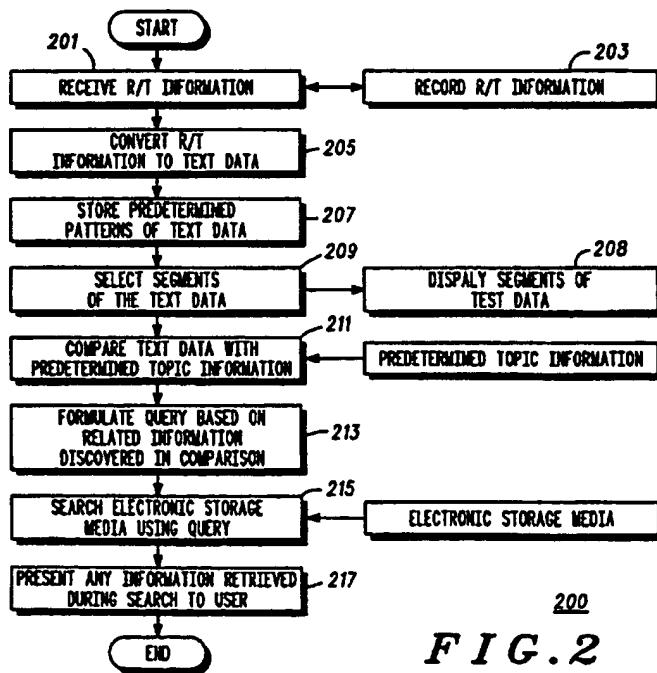
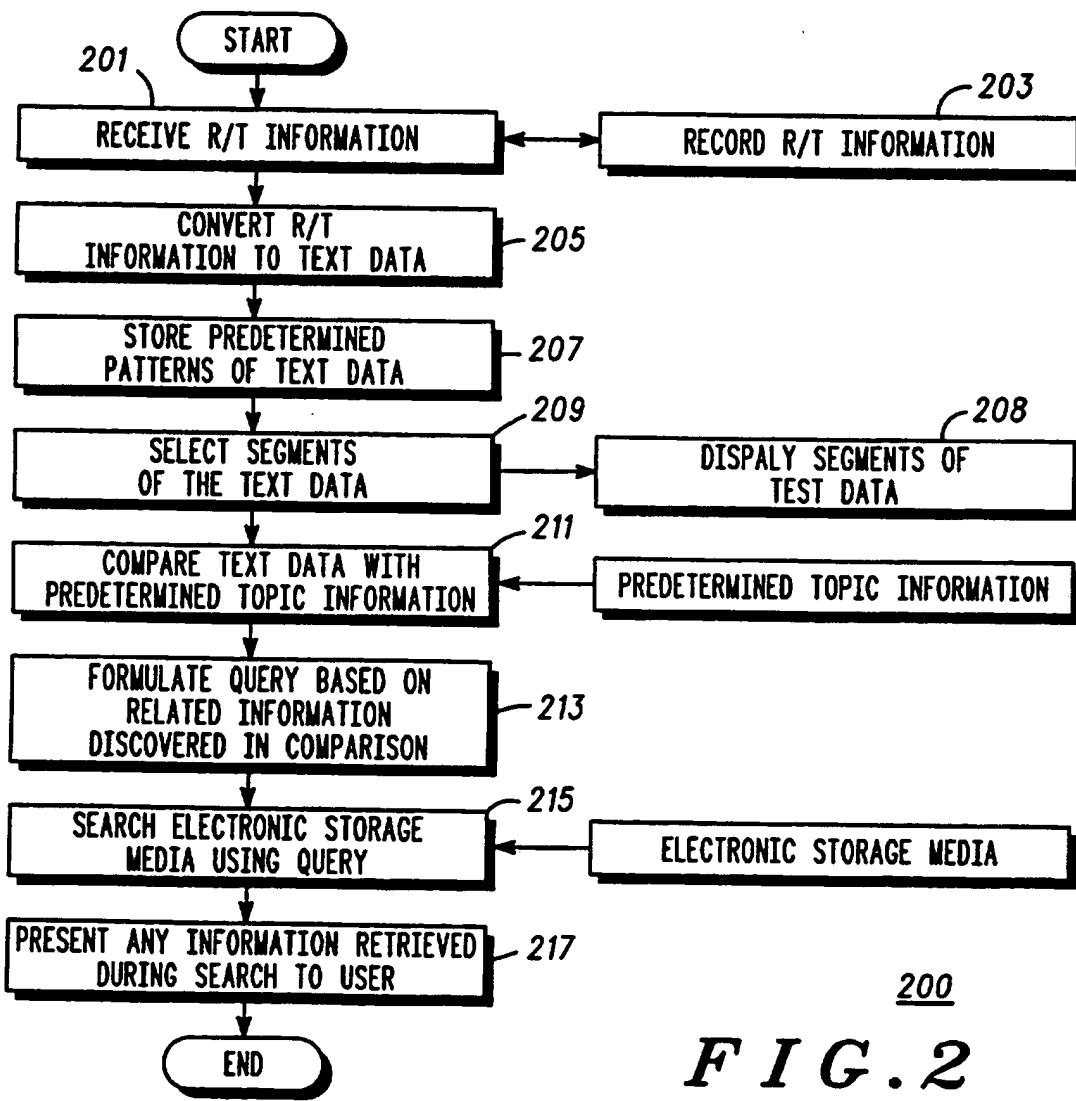
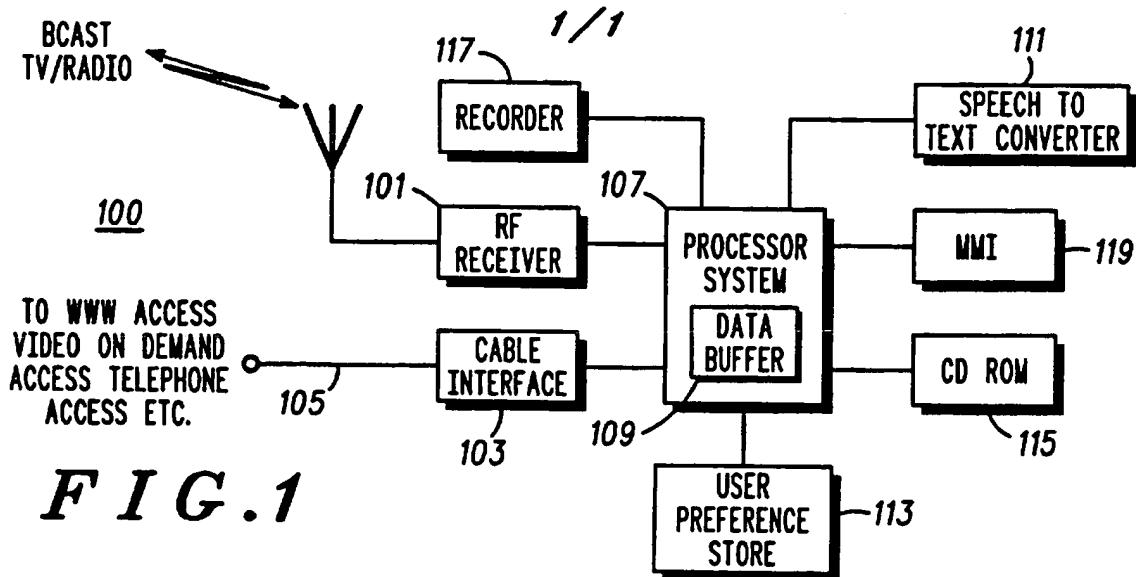


FIG. 2

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**MULTIMEDIA INFORMATION MANAGEMENT SYSTEM
AND METHOD OF USING SAME**

Technical Field

5 This invention relates in general to information management and more particularly to management of both real-time information and stored information.

Background

10 Considerable effort is being expended in order to design and integrate audio/video and computing technologies into single component equipment. This equipment may take the form of a television, radio and computer all combined into a single package. In view of the tremendous utility for such a device, this equipment is intended, for not only use with business applications, but also for home entertainment as well.

15 Although these devices does have the capability to combine a number of media into a single component, it will only run each of these media applications separately. Each media is processed on a different system within the integrated device with little or no interaction. Thus, audio and video media will run on their respective portions of the device while any computing functions, such as access to the Internet or World Wide Web, are run on their respective portions of the integrated device.

20 In some instances, specific media applications are capable of running simultaneously however no "real time" information that is received by a user is permitted to interact with those on stored or electronic media. For example, a viewer may be watching television however no Internet or computer applications are generally possible between these two media since they are independent and are not linked. Hence, although the television and computer systems may be operating simultaneously there is no interaction therebetween. This results in a great deal of related information, that would be helpful to the viewer, that cannot be easily accessed.

25 Therefore, a system and method are needed for permitting interaction to effectively interconnect real-time media services like radio or

television with stored media services such as those accessible through the use of the Internet or Compact Disk/ Read Only Memory (CD-ROM).

Summary of the Invention

- 5 A multimedia communication system for providing access between real-time multimedia information and stored multimedia information comprising; a receiver for receiving real-time multimedia information; at least one interface for accessing stored multimedia information; a processor for interpreting a predetermined portion of the real-time information from the first receiver such that the stored multimedia information is searched through the at least one interface to enable any corresponding stored information to be presented to a user.
- 10

Brief Description of the Drawings

- 15 FIG. 1 is a block diagram of the multimedia information management system according to the preferred embodiment of the invention.

- 20 FIG. 2 is a flow chart showing the method of managing information received from a real-time information source and one or more stored media services according to the preferred method of the invention.

Detailed Description of the Preferred Embodiment

- 25 Referring now to FIG. 1, the multimedia information management system 100 includes a radio frequency (RF) receiver 101 and a cable interface 103. The RF receiver 101 is used to receive real-time television and/or radio broadcasts through a radio frequency interface or via a physical link such as a cable television system or the like.

- 30 The RF receiver 101 will typically be a standard television receiver or radio equipment capable of receiving any type of commonly broadcast programming using audio/video media. The cable interface 103 is used to transmit and receive data from any number of commercially accessible electronic storage media. These electronic media may include such data bases such as LEXIS/NEXIS™, DIALOG™ or the like. They will also include those resources that are accessible through the Internet or World Wide Web. Additionally, it will also be evident to those skilled in the art, the
- 35

communications access cable 105, used to communicate this information, may also provide any other number of services such as telephone, video on-demand access, cable television and the like. The cable interface 103 can interface with a fiber optic cable, coaxial cable, a twisted copper pair or the like.

- 5 Both the RF receiver 101 and the cable interface 103 are controlled using a microprocessor associated with a processor system 107. The processor system 107 is a microprocessor with a high processing speed and computing power to rapidly interpret and process incoming information
- 10 from both the RF receiver 101 and cable interface 103. Included, preferably within the processor system 107, is one or more data buffer(s) 109. The data buffer 109 is a first-in first-out type (FIFO) memory that receives incoming information from the RF receiver 101, cable interface 103, a recorder 117 (discussed hereinafter), and a CD-ROM 115. As is well known in the art,
- 15 the information in the FIFO memory will be queued such that data that is first received will be the first to be purged when the data buffer 109 reaches its full capacity. Thus, the fixed capacity of the data buffer 109 permits only a predetermined amount of data to be stored at one time. Once at capacity, new data that is received is entered into the data buffer 109 while the oldest
- 20 data is expelled.

Since the information received by the RF receiver 101, will generally be audio and video information, a speech-to-text converter 111 is provided to convert audio information received by the processor system 107 into a textual format. Once in textual format, the information can be easily input

25 to the data buffer 109 where it can be more readily processed and/or manipulated for future use. Alternatively, information or data containing pointers to further information sources can also be transmitted with the broadcast to the RF receiver 101 or cable interface 103. In that event, no speech-to-text conversion will be necessary, and a user, viewing the speech

30 from a man-to-machine interface (MMI) 119 can select any topical information in which the user desires additional information.

Due to the gross amount of text that will be generated from the speech-to-text converter 111, a user preference memory 113 is provided to aid in matching user-selected information topics with incoming textual

35 information. Thus, a user of the multimedia information management

system 100 can preselect a number of topics that are of particular interest. These topics may include key words, phrases or the like. As text is entered into the data buffer 109, a comparison is made by the processor system 107 between the preselected topics and information, that are stored in the user preference memory 113, with data currently in the data buffer 109.

In the event a corresponding match is found, the matching information will be used to generate a query and then perform a search of selected electronically stored multimedia services. Thus, the corresponding information will be used by the processor system 107 to search any designated electronically stored information. These designated electronic storage media can be accessed through the cable interface 103 and include that information on the Internet or those stored locally such as on a CD-ROM 115.

Moreover, to even further enhance the capability of the multimedia information management system 100, a audio/video recorder 117 is also connected to the processor system 107. The audio/video recorder 117 is typically a standard video cassette recorder (VCR) that can record both audio and video information from the RF receiver 101 or from the cable interface 103. The recorder 117 gives, a user of the multimedia information management system 100, the capability to record broadcast programming that can be replayed at a later time. At the time the recorded information is replayed in real time, the information is then processed using the speech-to-text converter 111 just as if the recorded information were currently being received in real time. As indicated above, any audio portions of recorded information are then converted to text, queued in the data buffer 109 and subsequently used to form a query. A search for related information can then be performed should the user desire.

Finally in order to control the operation of the multimedia information management system 100, a man-to-machine interface (MMI) 119 is provided. The MMI 119 allows a user the capability to fully control operating functions of the information management system 100. In the preferred embodiment of the invention, the user preferably views all information received at the RF receiver 101 and the cable interface 103 at the MMI 119. Thus, information is received at the RF receiver 101 and is

displayed and interacts with other information at the MMI 119 where it can be selected and manipulated by the user.

The MMI 119 includes a number of user options or functions including entering user preferences into the user preference memory 113

- 5 and controlling the size of the information stored in the data buffer 109. Also, the MMI 119 is used for controlling information in the data buffer 109 that is to be searched using one or more electronic storage media. Moreover, the MMI 119 allows the user to instantaneously select text 10 information in the data buffer 109 while a broadcast is in progress. This situation may present itself during a news broadcast or whenever real time 15 information is viewed at a man-to-machine interface (MMI) 119.

In FIG. 2, the preferred method of providing a user interface between real-time (R/T) information and electronically stored information 200 is shown. Initially real-time information is received 201 by the RF receiver or 15 cable interface where it may be recorded or played back 203 at a later time. Information that is then received by either the RF receiver or by playback through the use of a video cassette recorder is converted 205 to textual data using a speech-to-text converter. The textual data is then queued and stored 207 into a data buffer where they can be selected for later processing.

- 20 Segments of the text data are selected 209 where they are then displayed 208 to the user at the MMI and/or compared 211 with predetermined topic information which has been selected by the user. Based on related or corresponding information found during this comparison, a query is formulated 213 to determine if other electrically 25 stored information is available on the same or similar topics. Additionally, a user will have the option of real time intervention using the MMI 119 to capture speech from the data buffer 109. The speech-to-text operation is then initiated at the processor system 107 using the MMI 119.

- Thereafter, a search is performed 215 for any related information on 30 electronically stored media. These media can be accessed through the use of such means as the Internet or World Wide Web or through locally available electrically stored media such as a magnetic tape or CD-ROM. Any information retrieved during the media search can then be presented 217 to the user by a display on a television or the MMI 119.

While the preferred embodiments of the invention have been illustrated and described, it will be clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions and equivalents will occur to those skilled in the art without departing from the spirit and scope of the present invention as defined by the appended claims.

5 What is claimed is:

Claims

1. A multimedia communication system for providing access between real-time multimedia information and stored multimedia information comprising:
 - 5 a receiver for receiving real-time multimedia information;
 - at least one interface for accessing stored multimedia information; and
 - a processor for interpreting a predetermined portion of the real-time multimedia information from the first receiver such that the stored
- 10 multimedia information is searched through the at least one interface to enable any corresponding stored information to be presented to a user.
2. A multimedia communication system as in claim 1 further comprising:
 - 15 a data buffer attached to the processor for selectively capturing a predetermined quantity of data from the receiver for interpretation by the processor.
3. A multimedia communication system as in claim 1 wherein pointer data is received from the real-time multimedia information for accessing the
- 20 corresponding stored information.
4. A multimedia communication system as in claim 2 wherein the data buffer is a first-in first-out (FIFO) memory.
- 25 5. A multimedia communication system as in claim 1 further comprising:
 - a user preference memory for indicating to the processor when predetermined topics of real-time information are being interpreted by the processor.
- 30 6. A multimedia communication system as in claim 1 further comprising:
 - a speech-to-text converter for converting audio information received by the receiver into textual information to be used by the processor.
- 35 7. A multimedia communication system as in claim 1 wherein the at least one interface accesses locally stored and externally stored information.

8. A multimedia interface for use in providing interaction between substantially real-time multimedia information and electronically stored multimedia information comprising:

5 a data buffer for storing selective portions of received real-time information; and

 at least one processor for utilizing the selective portions of real-time multimedia information to search for related information in the electronically stored multimedia information.

10

9. A multimedia interface as in claim 8 wherein the multimedia interface further includes:

 a user preference memory for storing predetermined user topics; and

15 wherein the at least one processor compares the predetermined user topics with the selective portions of received real-time information for determining searchable information.

20 10. A multimedia interface as in claim 8, wherein the at least one processor includes a user interface for selecting the real-time information to be searched and for entering the predetermined user topics.

25 11. A multimedia interface as in claim 8, wherein the real-time information includes television broadcasting, radio broadcasting, or audio/video recorded media.

30 12. A multimedia interface as in claim 8, wherein the at least one processor connects with an electronic media interface for accessing electronically stored information via a source connected by cable.

35 13. A method of providing a user interface between real-time information and electronically stored information comprising the steps of:

 receiving real-time information;

 storing predetermined portions of the received real-time information into a buffer;

- selecting segments of the stored real-time information;
 - processing the selected segments to determine related information;
 - searching at least one electronic storage media for the related information to obtain retrieved information; and
 - presenting the retrieved information to a user.
14. A method of providing a user interface as in claim 13 wherein the step of receiving further includes the step of:
accessing the related information from the at least one electronic
storage media using pointer data received directly from the real-time
multimedia information.
15. A method of providing a user interface as in claim 13, wherein the step of processing includes the step of:
reading portions of stored real-time information from a first-in first-out memory;
comparing the portions of stored real-time information with preselected user preference information from a user preference memory to determine the related information; and
formulating a query based on the related information for submission to the at least one electronic storage media.
16. A method of providing a user interface as in claim 13, wherein the step of receiving further includes the step of:
converting audio information received in real-time to textual information.
17. A method of providing a user interface as in claim 13, wherein the real-time information includes radio broadcasting, television broadcasting or audio/video recorded media.
18. A multimedia communications system substantially as hereinbefore described in FIG. 1 of the accompanying drawings.

- 19. A multimedia interface substantially as hereinbefore described with reference to the FIG. 1 in the accompanying drawings.**
- 20. A method substantially as hereinbefore described with reference to FIG. 5 2 in the accompanying drawings.**



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Examiner: Matthew Gillard
Date of search: 5 August 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): G4A AUDB, AUXX

Int Cl (Ed.6): G06F 17/30

Other:

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|---|--------------------|
| | None | |

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